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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2019 / 2020

PCO0165 – INTRODUCTION TO COMPUTER ARCHITECTURE AND OPERATING SYSTEM

(Foundation in Information Technology)

25 OCTOBER 2019
9.00 a.m – 11.00 a.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 3 pages (excluding the cover page) with 5 questions only.
2. Answer **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

Instructions: Answer **ALL** questions. Write your answers in the Answer Booklet.

QUESTION 1 [10 Marks]

- a. Explain briefly why a software designer has to study computer architecture. (2 marks)
- b. List **FOUR (4)** computers developed in the first generations (1944 - 1958). (2 marks)
- c. Discuss the difference between CISC and RISC processors. (4 marks)
- d. State **TWO (2)** features of the Intel Centrino. (2 marks)

QUESTION 2 [10 Marks]

- a. Convert the following binary numbers to decimal equivalents. Show computation steps.
 - i. 10110100.010_2
 - ii. 11111100.111_2(3 marks)
- b. Convert the following hexadecimal notations to their binary equivalents. Show computation steps.
 - i. $9CD.AB_{16}$
 - ii. $7EF.66_{16}$(3 marks)
- c. Convert the following octal notations to decimal equivalents. Show computation steps.
 - i. 167_8
 - ii. 0.54_8(3 marks)
- d. Draw the basic floating-point number representation format using 32-bit floating point (IEEE-754)? (1 mark)

QUESTION 3 [10 Marks]

- a. Calculate the addition arithmetic operation of the following unsigned binary numbers. Show computation steps.
 - i. $00110110 + 01110110$
 - ii. $11101110 + 10111001$(2 marks)

Continued...

- b. Calculate the subtraction arithmetic operation of the following unsigned binary numbers. Show computation steps.
- 11001010 - 00110100
 - 11110111 - 10111101
- (3 marks)
- c. Solve the following addition operations using the two's complement addition in 5-bit for signed integer. Show computation steps.
- 9 + (-1)
 - (-2) + (7)
- (3 marks)
- d. Solve the subtraction operation (-8) - (-4) using the two's complement subtraction in 4-bit for signed integer. Show computation steps.
- (2 marks)

QUESTION 4 [10 Marks]

- a. List the **FOUR (4)** elements of machine instructions.
- (2 marks)
- b. Explain the meaning of the following assembly language instructions code.
- MVI A, 40H
 - LDA 6020H
 - STA 6010H
 - LXI H, 3000H
- (4 marks)
- c. Write an assembly program based on the following steps:
- Let say, the memory locations 6000H and 6001H contain the following operands:
(6000H) = 14H
(6001H) = 19H
 - Use an addition operation to add both operands.
 - Store the result in memory address 6002H.
- (4 marks)

QUESTION 5 [10 Marks]

- a. Explain briefly the nature of an operating system that was designed for larger system compared to a stand-alone personal computer.
- (2 marks)
- b. User interface (UI) is one of the most critical factors of designing an operating system because it brings structure to the interaction between a user and the computer. List and explain briefly the **TWO (2)** common types of user interface (UI) found in the operating system.
- (2 marks)

Continued...

- c. What is a utility program? Briefly discuss the functions of the following utility programs.
- i. Optimize drive utility
 - ii. Backup utility
- (4 marks)
- d. A file is a set of associated information that is written on secondary storage, typically with two types of view. Briefly explain the two types of view.
- (2 marks)